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AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER

AMARI, ALESSANDRO V

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 07/21/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,201

Applicant(s)

MOTAMEDI ET AL

Examiner

Alessandro V. Amari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 15-19 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 7, 9-14 and 20-23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 7 of the specification in the section titled "Brief Description of the Drawings", there is no description provided for Figure 9 of the drawings.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 9 and 23, the phrases "wherein said plurality of EH gratings are included within a chirped grating" and "passing an optical signal through a series of EH gratings with different center wavelengths includes passing said optical signal through a chirped EH grating" are unclear since Figure 7 of the disclosure shows that the EH gratings are combined into a single electroholographic filter element (EFE) so that in fact the chirped grating is the EFE which is a series or concatenation of EH gratings as opposed to the current recitation which appears to claim a separate element (i.e., chirped grating) from the EH gratings.

Claim Objections

4. Claims 24-26 are objected to because of the following informalities:

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Regarding claim 24, the abbreviations for "EFE and "EH" should be spelled out. Also, in line 4 of claim 24, the period at the end of the line should be deleted. Claims 25 and 26 inherit the same error since they are dependent on claim 24.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6, 8, and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by De Vre et al U.S. Patent 5,640,256.

In regard to claims 1 and 15, De Vre et al discloses (see Figures 1, 2, 7, 8, 13 and 14) a tunable optical filter or a method for filtering an optical signal comprising a plurality of electroholographic (EH) gratings (12) with different center wavelengths, said EH gratings being optically connected such that an input optical signal can pass through at least one of said plurality of EH gratings as shown in Figures 2, 7 and 8 wherein said EH gratings are activated to filter said input optical signal in response to an applied voltage or selectively applying a voltage across at least one of said EH gratings to activate said at least one EH grating, thereby filtering the optical signal at a desired center wavelength as described in column 8, lines 60-67, column 9, lines 1-67, column 10, lines 1-16, and column 12, lines 4-63.

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Regarding claim 2, De Vre et al discloses (see Figure 2, 7, 8, 14, 15) electrode pairs (14A, 14B, 78) associated with said EH gratings for applying voltage across EH gratings of a desired center wavelength to activate said EH gratings with said desired center wavelength; and a voltage controller (26, 92) associated with said electrode pairs for controlling the application of voltage across said EH gratings by the respective electrode pairs.

Regarding claim 3, De Vre et al discloses that the EH gratings of the same center wavelength are controlled simultaneously by said voltage controller as described in column 2, lines 54-57, column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63 and as shown in Figures 7, 8, 13 and 14.

Regarding claim 4, De Vre et al discloses that said EH gratings are tunable over a range of wavelengths in response to adjustments in the applied voltage as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 5, De Vre et al discloses that the tunable wavelength ranges of said EH gratings combine to form a continuously tunable wavelength range as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 6, De Vre et al discloses that at least two of said EH gratings having different center wavelengths are optically connected such that an input signal can pass through said at least two EH gratings in series as described in column 8, lines

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60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63 and as shown in Figure 7,8, 13 and 14.

Regarding claim 8, De Vre et al discloses that said EH gratings are formed in photorefractive crystals as described in column 5, lines 40-44.

Regarding claim 16, De Vre et al discloses further including adjusting the voltage that is applied across said at least one EH grating to tune the center wavelength of said at least one EH grating as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 17, De Vre et al discloses further including applying a voltage to a different one of said EH gratings to filter said optical signal at a different center wavelength as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 18, De Vre et al discloses further including filtering across a range of wavelengths by serially activating and tuning different sets of said EH gratings as described in column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Regarding claim 19, De Vre et al discloses further including simultaneously applying voltage across a set of EH gratings that have the same center wavelength as described in column 2, lines 54-57, column 8, lines 60-67, column 9, lines 1-67 and column 10, lines 1-16 and column 12, lines 4-63.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Vre et al U.S. Patent 5,640,256 in view of Norwood et al U.S. Patent 6,256,428.

In regard to claim 24, De Vre et al discloses (see Figures 1, 2, 7, 8, 13 and 14) a tunable optical filter comprising a plurality of EFEs that are optically aligned in a series such that an input optical signal can pass through each of the EFEs as shown in Figures 13 and 14, each set of EFEs including EH gratings (12) that have different wavelength ranges as shown in Figures 8 and 14, electrode pairs (14A, 14B, 76) associated with each EFE for applying voltage across said EFEs to activate said EH gratings within said EFEs; and a voltage controller (26, 92) associated with said electrode pairs for controlling the application of voltage to said EFEs by the respective electrode pairs as described in column 8, lines 60-67, column 9, lines 1-67, column 10, lines 1-16, and column 12, lines 4-63.

Regarding claim 25, De Vre et al discloses that said EH gratings within said EFEs are tunable over said wavelength ranges in response to adjustments in the applied voltage as described in column 8, lines 60-67, column 9, lines 1-67, column 10, lines 1-16, and column 12, lines 4-63.

Regarding claim 26, De Vre et al discloses that the tunable wavelength ranges of said EH gratings within said EFEs combine to form a continuously tunable wavelength range as described in column 8, lines 60-67, column 9, lines 1-67, column 10, lines 1-16, and column 12, lines 4-63.

However, De Vre et al does not teach a series of sets such that an input optical signal can pass through each set of EFEs, each set of EFEs including EH gratings that have different wavelength ranges than the other sets of EFEs.

In regard to claim 24, Norwood does teach a series of sets of filter elements such that an input optical signal can pass through each set, each set includes gratings that have different wavelength ranges than the other sets of filter elements as shown in Figures 5 and 6 and as described in column 6, lines 40-66.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the holographic filter elements of De Vre et al in the set configuration of Norwood et al in order to provide for precise segregation of multiple wavelength signals in multiplexing/demultiplexing applications.

Allowable Subject Matter

9. Claims 7, 9, 10-14 and 20-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claim 7 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "an input birefringent element, located in an optical path that is before said plurality of EH gratings, for splitting said input optical signal into first

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and second polarized beams having different polarization states before said input optical signal passes through said plurality of EH gratings; wherein said plurality of EH gratings includes a first group of EH gratings having different center wavelengths that are optically connected such that said first polarized beam can pass through said first group of EH gratings and a second group of EH gratings having the same center wavelengths as said first group of EH gratings that are optically connected such that said second polarized beam can pass through said second group of EH gratings, said first and second polarized beams passing through the respective groups of EH gratings in parallel" as set forth in the claimed combination.

Claims 9 and 23 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "said plurality of EH gratings are included within a chirped grating" or "passing said optical signal through a chirped EH grating" as set forth in the claimed combination.

Claim 10 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "an input birefringent element, located in an optical path that is before said plurality of EH gratings, for splitting said input optical signal into first and second polarized beams having different polarization states before said input optical signal passes through said plurality of EH gratings; an input polarization rotator, located in an optical path that is between said input birefringent element and said plurality of EH gratings, for bringing said first and second polarized beams to the same polarization state; an output birefringent element, located in an optical path that is after said plurality of EH gratings, for combining said first and second polarized beams into

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an output signal after said first and second polarized beams have passed through said plurality of EH gratings; and an output polarization rotator, located in an optical path that is between said plurality of EH gratings and said output birefringent element, for bringing said first and second polarized beams to different polarization states" as set forth in the claimed combination. Claims 11-13 are also allowable based upon their dependency on claim 10.

Claim 14 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "polarization rotators located between EH gratings that have the same center wavelength" as set forth in the claimed combination.

Claim 20 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "splitting said optical signal into two polarized beams before said optical signal is passed through said series of EH gratings; and rotating the polarization state of one of said beams such that said two polarized beams have the same polarization state before said two polarized beams are passed through said series of EH gratings" as set forth in the claimed combination. Claim 21 is also allowable based upon its dependence on claim 20.

Claim 22 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "rotating the polarization states of said two polarized beams after said beams have been filtered by activated EH gratings" as set forth in the claimed combination.

The prior art of record, De Vre et al teaches filtering an optical signal comprising passing an optical signal through a series of electroholographic (EH) gratings with

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different center wavelengths, said EH gratings being activated in response to an applied voltage; and selectively applying a voltage across at least one of said EH gratings to activate said at least one EH grating, thereby filtering the optical signal at a desired center wavelength. Furthermore, De Vre et al teaches that adjusting and applying the voltage that is applied across said at least one EH grating tunes the center wavelength of at least one EH grating. De Vre in view of Norwood further teaches combining the filter elements in a series of sets each set of filter elements having different wavelength ranges than other sets of filter elements. However, De Vre et al does not teach including input and output birefringent elements before and after the gratings or including an input polarization rotator located in the optical path between the input birefringent element and the gratings or that the plurality of EH gratings are included within a chirped grating and there is no motivation or teaching to modify this difference as derived.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. International publication WO 00/02098 teaches a tunable optical filter comprising a plurality of electroholographic gratings with different center wavelengths, said EH gratings being optically connected such that an input optical signal can pass through at least one of said plurality of EH gratings, wherein said EH gratings are activated to filter said input optical signal in response to an applied voltage and wherein the gratings are tunable over a range of wavelengths in response to the applied voltage as shown in Figures 2(a) and 2(b). Popovich et al U.S. Patent

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6,426,811 also teaches a tunable filter comprising a plurality of electroholographic gratings with different center wavelengths, said EH gratings being optically connected such that an input optical signal can pass through at least one of said plurality of EH gratings, wherein said EH gratings are activated to filter said input optical signal in response to an applied voltage and wherein the gratings are tunable over a range of wavelengths in response to the applied voltage as shown in Figure 17 and as described in column 17, lines 56-61.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava *ava*
July 10, 2003


MARK A. ROBINSON
PRIMARY EXAMINER